

REMARKS

Claims 1-20 are pending in the present application. Claims 1, 4, 7, 8, 12, 13, 19, and 20 are amended. No new matter is added. Claims 1-20 are rejected under 35 U.S.C. § 103(a). The rejections are respectfully traversed in light of the following remarks, and reconsideration is requested.

Further, Applicants submit a new Power of Attorney and correspondence change. Please address any future correspondences in the above matter to the new address:

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The Examiner stated the oath or declaration was effective. A more recent declaration is submitted with this response.

Rejections under 35 U.S.C. § 103(a)

Claims 1-4 and 6-7 were rejected as being unpatentable over Chang (U.S. 6,625,352) in view of Raguin et al. (20020131699). The Examiner writes, in part:

Re claim 1, Chang teaches . . . a lens (72, fig. 7, col. 5, ln. 34) attached to the angled distal end of the ferrule (76, fig. 7) . . .

But, Chang et al. fails to explicitly teach a plano-convex collimating lens.

However, within the same field of endeavor, Raguin et al. teach in fig. 2, a collimating lens (13) is plano-convex (wherein the surface 10c is planar and surface 10 is convex).

Chang discloses an integral optical element 72 formed from a non-birefringent optical element and an aspherical lens, where element 72 has a surface adjacent the ferrule that is

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angled, as shown in Fig. 7. The optical element 72 has an angled planar surface that is angled relative to the plane of the convex lens.

In contrast, claim 1, as amended, recites "a plano-convex lens having a planar surface attached to the angled distal end of the ferrule, . . . wherein the planar surface is parallel to the plane of the convex surface of the lens". Support for the amendment is found in Applicants' specification at Figs. 2 and 3 and accompanying text. Thus, no new matter is added. By using a plano-convex lens without an angled planar surface, the plano-convex lens can be moved laterally or horizontally along the angled ferrule and fiber to achieve a desired pointing angle, as discussed in Applicants' specification.

Raguin discloses, in Fig. 2, an array 10 of collimating or convex lenses, where the planar surface 10c of the array is attached to a ferrule 12 by a layer of adhesive material or polymer 14. The array 10 has a planar surface 10c that is parallel to the plane of the convex lens 13. However, the planar surface 10c is not attached to an angled surface of the ferrule or fiber, but rather a parallel surface.

It appears that the Examiner is combining the plano-convex lens of Raguin with the angled structure of Chang by stating that it would be obvious to provide a suitable surface to adhere the fiber optic. However, Applicants' assert that there is no motivation to combine Chang with Raguin.

An object of Chang is to "provide an optical coupling system having an in-line or coaxial arrangement between an optical axis of a collimating lens and a center of a waveguide.". (Chang, col. 1, lines 61-64). Thus, the invention of Chang is directed towards an "in-line" arrangement. This is also shown in Chang's admitted prior art in Figs. 2 and 3, which demonstrate an "off-axis" arrangement and which Chang discussed the

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disadvantages of. It is evident from all of Chang's drawings of the invention, shown in Figs. 4-7, that the angled fiber and ferrule is coupled to an angled surface of a lens element, where light exits along the axis of the convex lens. Consequently, there is no suggestion or teaching to have a plano-convex lens having parallel lens planes. In fact, Applicants believe Chang actually teaches away from this, as shown and discussed in the prior art of Figs. 2 and 3. Further, there is nothing in Raguin that even suggests using an angled ferrule and fiber.

Therefore, Applicants' contend that the combination of Chang and Raguin is improper as the combination is based on hindsight. Accordingly, Applicants believe claim 1 is patentable over Chang and Raguin.

Claims 2-4 and 6-7 depend on claim 1 and are thus patentable for at least the same reasons as claim 1.

Further, claim 4, as amended, recites "an air gap between the planar surface of the lens and a fiber end face". Support for the amendment is found at Fig. 2 and accompanying text. A very small air gap minimizes or eliminates comatic aberration of the collimated light. Small amounts of adhesive allow easier movement or adjustment of the plano-convex lens to provide the desired positioning angle. In contrast, both Chang and Raguin teach filling in the space between the ferrule and lens. In Chang, "the space between the lens and the fiber end is filled with the powerless non-birefringent element". (Chang, col. 5, lines 64-66). In Raguin, shown in Fig. 2, the "fiber 11 in ferrule 12 is attached . . . to a lens 10 using an adhesive material or polymer 14 as an intermediary between the front surface 12a of the ferrule 12 and the back surface 10c of substrate 10a." (Raguin, paragraph 43).

Therefore, for this additional reason, claim 4 is further patentable over Chang and Raguin.

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Claims 8-20 were rejected as being unpatentable over Raguin.

Independent claim 8, as amended, recites "providing a plano-convex lens having a planar surface and a convex surface, the planar surface parallel to the plane of the convex surface; placing a the planar surface of the plano-convex lens over the planar, angled fiber termination". Similarly, independent claim 19, as amended, recites "providing at least one plano-convex lens having a planar surface and a convex surface, the planar surface parallel to the plane of the convex surface; placing the planar surface of the at least one plano-convex lens on the angled fiber termination array". Independent claim 20, as amended, recites "providing an array of plano-convex lenses, wherein the planar convex lenses have planar surfaces and opposing convex surfaces, wherein the planar surfaces are parallel to the plane of the opposing convex surfaces; placing an angle polished fiber termination under one of the planar surfaces of the plano-convex lenses".

Thus, claims 8, 19, and 20 are patentable over Raguin for reasons similar to those discussed above with respect to Claim 1. In particular, Raguin does not teach or suggest the plano-convex lens attached to a slanted ferrule and fiber.

Claims 9-18 depend on claim 8 and are thus patentable for at least the same reasons as claim 8.

Claim 5 was rejected as being unpatentable over Chang in view of Raguin and further in view of Kanazawa. Kanazawa was cited for teaching "a substrate with an angled hole (18) shaped to fit the ferrule, the ferrule (19) being inserted in the hole."

However, Kanazawa does not remedy the deficiencies of Chang and Raguin as discussed above. Therefore, claim 5 is patentable over Chang in view of Raguin and Kanazawa.

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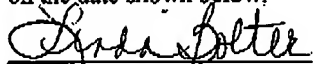
Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections of claims 1-20 under 35 U.S.C. § 103(a).

CONCLUSION

For the foregoing reasons, Applicants believe pending claims 1-20 are allowable, and a notice of allowance is respectfully requested. If the Examiner has any questions regarding the application, the Examiner is invited to call the undersigned Attorney at (949) 752-7040.

Certification of Facsimile Transmission

I hereby certify that this paper is being facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.



Linda Bolter

August 23, 2004

Date of Signature

Respectfully submitted,



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